



Designation: D7694/D7694M – 18

## Standard Test Methods for Self-Adhesive Modified Bituminous Sheet Material<sup>1</sup>

This standard is issued under the fixed designation D7694/D7694M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 These test methods cover test procedures for prefabricated, reinforced, self-adhesive (SA) polymer-modified bituminous sheet materials designed for single- or multiple-ply application in roofing and waterproofing membranes.

1.2 These test methods specifically address the self-adhesive characteristics of modified bituminous sheet materials, and are intended as a supplement to those found in Test Methods [D5147/D5147M](#).

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

1.4 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

### 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[D146/D146M](#) Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing

<sup>1</sup> These test methods are under the jurisdiction of ASTM Committee D08 on Roofing and Waterproofing and are the direct responsibility of Subcommittee D08.04 on Felts, Fabrics and Bituminous Sheet Materials.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[D3167](#) Test Method for Floating Roller Peel Resistance of Adhesives

[D1079](#) Terminology Relating to Roofing and Waterproofing  
[D5147/D5147M](#) Test Methods for Sampling and Testing Modified Bituminous Sheet Material

[E177](#) Practice for Use of the Terms Precision and Bias in ASTM Test Methods

[E691](#) Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

### 3. Significance and Use

3.1 These test methods are used to evaluate the properties of self-adhesive modified bituminous membranes. The results determine compliance with the applicable specifications, or they can be used for comparative analysis.

3.2 The test methods apply to “as manufactured” material and may not apply to material that has been weathered or is past the manufacturer’s recommended shelf life.

### 4. Sampling

4.1 From each shipment or fraction thereof, select at random a number of rolls equal to one half the cube root of the total number rolls of the lot. If the calculated number is fractional, express it as the next highest whole number. For convenience, a table showing the number of rolls to be selected from the lots of various sizes is given in Test Method [D146/D146M](#).

4.2 The minimum sample shall consist of five rolls. The rolls so selected constitute the representative sample used for all subsequent observations and tests pertaining to the lot of material being tested.

4.3 When mutually agreed upon by the concerned parties, other sampling frequencies may be used and reported within the framework of these procedures.

### 5. Adhesion to Plywood

5.1 *Scope*—This test method covers the determination of the adhesive properties of the product sheets to a standardized plywood substrate, as set forth in Test Method [D3167](#) except as noted below. The method also allows for the evaluation of a membrane installation over the standardized substrate treated with a primer.

5.2 *Conditioning*—Testing and conditioning is to be performed at test temperatures  $23 \pm 2^\circ\text{C}$  [ $73 \pm 4^\circ\text{F}$ ] and  $4 \pm 1^\circ\text{C}$

[40 ± 2°F] unless otherwise specified. The plywood must be conditioned at test temperatures for at least seven days prior to assembly. All other materials used to construct the assembly should be conditioned for at least 1.5 h ± 0.5 h prior to testing. Similarly, the test assembly (self-adhesive sheet adhered to plywood), the deadweight roller, and the primer (if used), must be conditioned at the test temperature for at least 1.5 h ± 0.5 h prior to testing.

5.3 Specimen Preparation:

5.3.1 The test specimen shall consist of one piece of self-adhesive sheet, 75 by 200 ± 3 mm [3 by 8 ± 1/8 in.], overlapped and bonded 75 by 100 ± 3 mm [3 by 4 ± 1/8 in.] to the top surface of a piece of plywood that is 100 by 200 ± 3 mm [4 by 8 ± 1/8 in.]. Primer is optional and may be applied to the substrate per manufacturer specification, appropriate for specimen preparation temperatures. The grain direction of the plywood shall run the 200 ± 3 mm [8 ± 1/8 in.] length for the test assembly. The overlap shall be such that the last 4 in. of plywood (a strip 100 by 100 ± 3 mm [4 by 4 ± 1/8 in.]) is exposed, and 100 ± 3 mm [4 ± 1/8 in.] of the self-adhesive sheet is available for gripping in the test machine (Fig. 1). The plywood shall be 6 mm [1/4 in.] minimum thickness, virola, birch, or equivalent smooth surfaced, veneered plywood. Test surface shall be free of knots, repairs, or other similar imperfections.

5.3.2 At no time shall the roller stop travel on the area to be tested. Spacers should be used to allow the roller to travel off of the sample before it is returned. Uniformly press the self-adhesive sheet onto plywood by rolling three times back and forth on the aligned specimens in the direction of the plywood grain with a roller of a mass of 12 ± 1 kg [26 ± 2 lb], a diameter of 125 ± 3 mm [5 ± 1/8 in.], and a width of 125 ± 3 mm [5 ± 1/8 in.]. Do not allow for any additional pressure to be applied onto the self-adhesive sheets. The deadweight roller should be rolled at a rate of 4 to 6 s per back and forth cycle. The test specimen shall be completely taut with no slack in the self-adhesive sheet.

5.3.3 At least five specimens shall be tested for each test temperature.

5.3.4 The specimens shall be assembled individually. Cutting specimens to size after assembly may influence the test results.

NOTE 1—Adhesion to other potential deck materials and substrates may also be determined by this test method.

5.4 Apparatus:

5.4.1 Perform the test in a constant rate of extension type test machine.

5.4.2 The rate of travel of the crosshead shall be 50 ± 3 mm/min [2 ± 1/8 in./min]. This rate, which provides a laminate

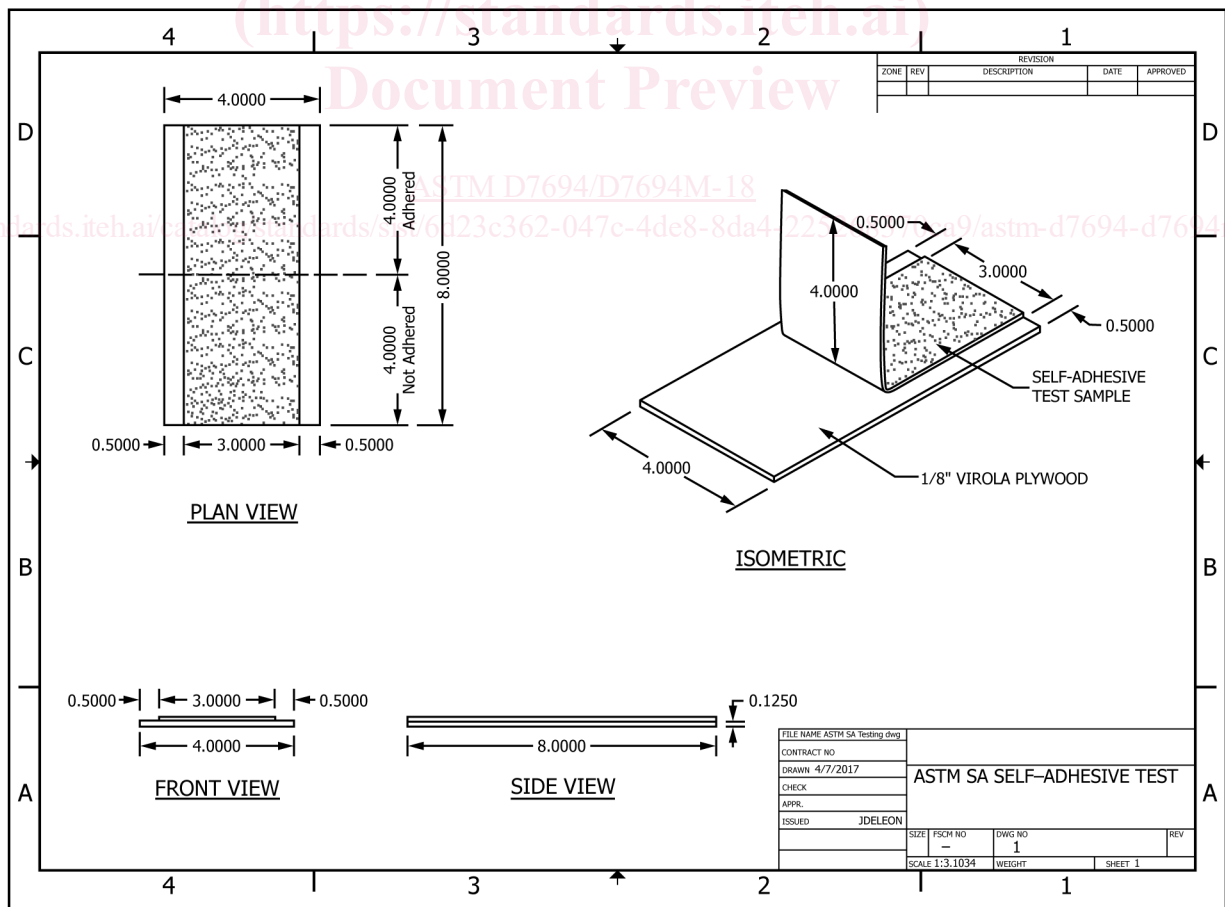


FIG. 1 Self-Adhesive Sample Preparation

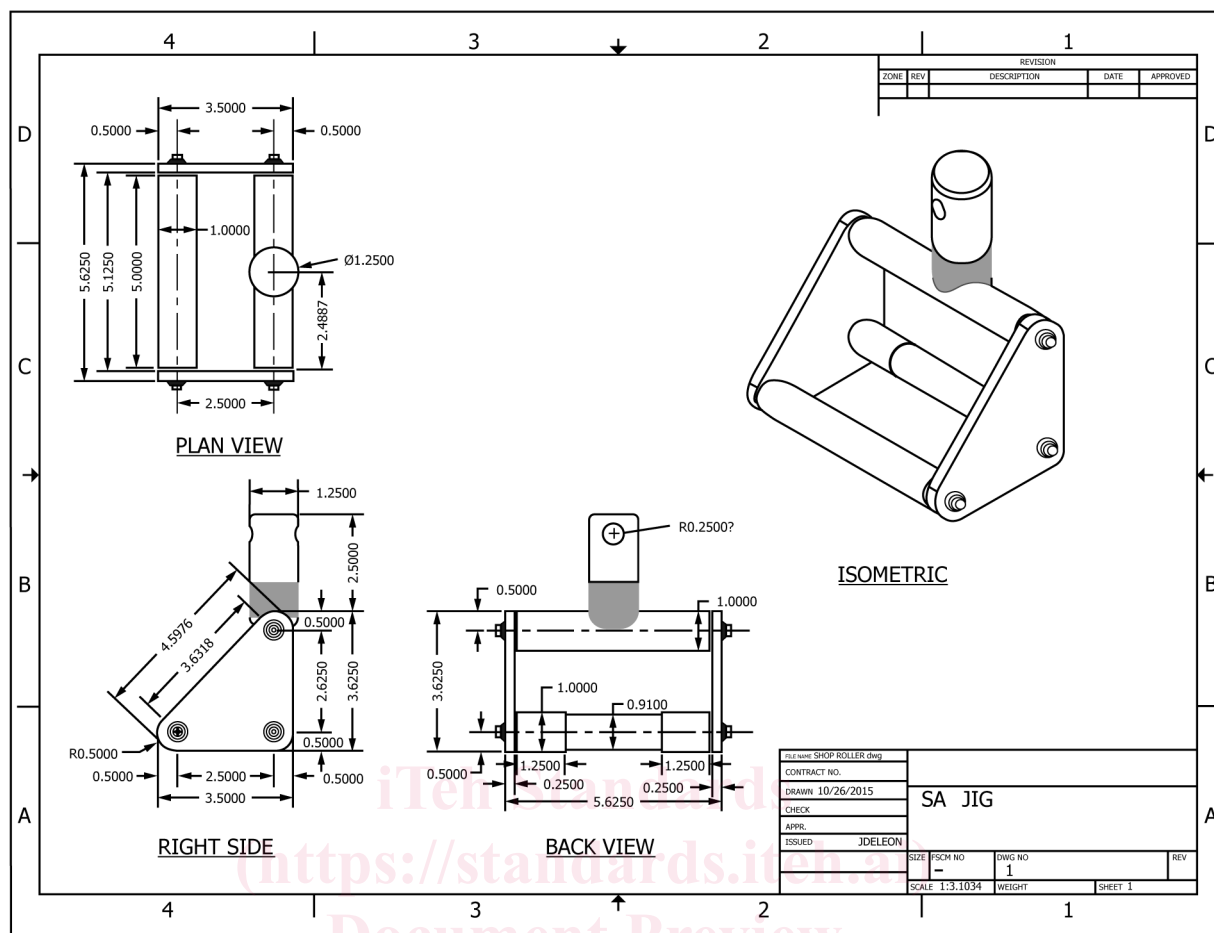


FIG. 2 Self-Adhesive Testing Apparatus

separation rate of  $50 \pm 3$  mm/min [ $2 \pm \frac{1}{8}$  in./min], shall be uniform throughout the test.

5.5 Procedure:

5.5.1 Conduct the test after the test assembly has been conditioned at the test temperature for  $1.5 \text{ h} \pm 0.5 \text{ h}$ .

5.5.2 Separate the free end of the sheet from the plywood for a distance of  $100 \pm 3$  mm [ $4 \pm \frac{1}{8}$  in.] leaving  $100 \pm 3$  mm [ $4 \pm \frac{1}{8}$  in.] of bonded length. Maintain the specimen in the approximate plane of the clamps during the test. Peel the whole bonded area, ensuring that proper peel behavior is taking place before and after the middle  $50 \pm 3$  mm [ $2 \pm \frac{1}{8}$  in.] of applied sample.

5.6 Calculation—Determine the average peel strength between the sample travel of 25.4 to 76.2 mm [1 to 3 in.] as the average load line that accommodates the recorded curve. Record the load so indicated, corrected for initial off-zero starting point caused by weight of the test assembly. (See Fig. 4.)

5.7 Reporting—For each series of tests, report the number of measurements, the test temperature, the average peel strength and standard deviation between the sample travel of 25.4 to 76.2 mm [1 to 3 in.] in N/25 mm of width [lbf/in. of width], and the failure mode. If primer is utilized, the type of primer, product name, and quantity (volume/unit area) applied shall be clearly reported.

5.8 Precision and Bias:

5.8.1 The precision of this test method is based on an intralaboratory study of ASTM Work Item WK26070 – Standard Test Method for Testing Self-Adhesive Modified Bituminous Sheet Material, conducted in 2015. Two laboratories participated in this study, testing various sheet materials over two different bases. Every “test result” represents an individual determination. The laboratories were asked to report four replicate test results for each base/sheet/temperature combination. Except for the extremely limited laboratory participation, Practice E691 was followed for the design and analysis of the data; the details are given in ASTM Research Report No. RR:D08-1019.<sup>3</sup>

5.8.1.1 Repeatability (*r*)—The difference between repetitive results obtained by the same operator in a given laboratory applying the same test method with the same apparatus under constant operating conditions on identical test material within short intervals of time would in the long run, in the normal and correct operation of the test method, exceed the following values only in one case in 20.

(1) Repeatability can be interpreted as maximum difference between two results, obtained under repeatability conditions,

<sup>3</sup> Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:D08-1019. Contact ASTM Customer Service at service@astm.org.